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Retrospective analysis of percutaneous endoscopic gastrostomy cases in the endoscopy unit

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ABSTRACT

Aims: Enteral nutrition is considered a primary, first-choice nutrition method when the passage in the gastrointestinal tract is open. The present study attempted to present the experience of percutaneous endoscopic gastrostomy performed in our endoscopy unit.

Methods: This study investigated the data of 39 patients undergoing the placement of a percutaneous endoscopic gastrostomy (PEG) catheter in our endoscopy unit between July 2019 and November 2020. A team of experienced specialists, assistant physicians, and nurses performed the procedure at the bedside for patients intubated in the intensive care unit or with a poor general condition or in the endoscopy unit for other patients after being sedated by the anesthesiologist. The patients were started to be fed through the PEG catheter with an initial dose of 10 cc/hour, correlated with the clinical nutrition unit, at the 6th and 12th hours following the procedure, and the dose was gradually increased to the target dose. The patients' data were presented as frequencies and percentages (%).

Results: The data of 39 patients, 17 (44%) females and 22 (56%) males, were retrospectively investigated in this study. The median age of the patients was found to be 67 years (21-102 years). While 32 patients were hospitalized in the intensive care unit, four received palliative care, and three were followed up in the clinic wards. Considering the pathologies leading to the indication of PEG catheter placement, 15 patients had Cerebrovascular disease, 12 had Alzheimer's disease, 4 had absent swallow reflex, 3 had a subarachnoid hemorrhage, 2 had a hypoxic brain, 1 had spastic cerebral palsy, 1 had Sanfilippo syndrome, and 1 had oral feeding intolerance. No complications developed in any of the patients during the procedure. While 24 patients were discharged, mortality developed in 15 during hospitalization due to primary pathology.

Conclusion: Contemporarily, a key requirement for optimal treatment is adequate nutrition, and the superiority of enteral nutrition is indisputable in providing such nutrition. PEG is known to be a more efficient method in long-term nutrition when compared to other enteral feeding methods. In conclusion, PEG can be performed for relevant patients with low complication rates in general surgery endoscopy units.

Keywords: Enteral nutrition, gastrostomy, gastric feeding tubes, endoscopic surgical procedure

INTRODUCTION

Percutaneous endoscopic gastrostomy (PEG), an enteral feeding method, was first described by Gauderer et al.[1] in 1980. Now, PEG is widely acknowledged as the most efficient way to provide long-term nutritional support.[2,3] It is a safe and effective method, offering some advantages over the nasoenteral route to ensure the delivery of nutrients to the digestive system in patients with difficulty in oral consumption of food and liquids.[4]

However, enteral nutrition may not be provided efficiently in a number of conditions leading to passage problems (e.g., larynx, esophagus, and stomach cancers) or causing dysphagia (e.g., genetic diseases, cerebrovascular accident, head trauma, brain tumor, and amyotrophic lateral sclerosis). Enteral nutrition is the safest and most cost-effective method for artificial nutrition among those who cannot maintain adequate oral intake. By preventing intestinal rest, it is possible to reduce the possibility of intestinal mucosal atrophy, bacterial translocation, and disruption of the immunological barrier function of the intestinal wall.[2]

The following methods can be adopted as an enteral feeding route: nasoenteral route, PEG, percutaneous endoscopic gastro-jejunostomy, percutaneous endoscopic jejunostomy or surgical gastrostomy, and jejunostomy. If patients are to receive enteral nutrition for less than four weeks, nasoenteral nutrition is the recommended route. Yet, considering their clinical conditions, the percutaneous route should be adopted if they are to receive enteral nutrition for more than four.[5]

The present study attempted to retrospectively investigate the PEGs performed in the surgical endoscopy unit and intensive care units.

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METHODS

The study was carried out with the permission of Ankara City Hospital No:1 Clinical Researches Ethics Committee (Date: 22.03.2023, Decision No: E1-23-3389). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

Patients' Data

The present study retrospectively recruited 39 patients undergoing PEG in the general surgery endoscopy unit of our hospital between July 2019 and November 2020. The patients' demographic information, clinicopathological data, and laboratory findings were extracted from the hospital's electronic records.

Inclusion Criteria

According to the recommendations from "ESPEN practical guideline: Clinical nutrition in surgery 2021 (6)," those needing long-term (> 4 weeks) enteral nutrition and those 18 years and older who had PEG inserted by our unit were included in the study. The PEG procedure was performed upon written consent from the patient's first-degree relatives.

A team of experienced specialists, assistant physicians, and nurses performed the procedure at the bedside for patients intubated in the intensive care unit or with a poor general condition or in the endoscopy unit for other patients after being sedated by the anesthesiologist.

Exclusion Criteria

Patients younger than 18 years and whose records could not be accessed were excluded from the study.

PEG Technique

The abdominal wall is stained with povidone-iodine appropriately, and the area is covered with sterile drapes. The stomach is entered with a fiberoptic endoscope. The stomach and duodenum are thoroughly evaluated for local contraindications. While the patient is supine, sufficient gas insufflation is performed to provide gastric distension. Ensuring a dark environment in the operation room, the endoscope light becomes visible with transillumination on the anterior abdominal wall for safe operation. The assistant presses the transillumination area with their finger, and an indentation toward the lumen becomes visible in the stomach wall thanks to the pressure with the endoscope. The skin incision point for the PEG catheter is then determined to coincide with the distal corpus anterior wall of the stomach. The assistant injects a local anesthetic into the skin and under the skin and makes a 3-5 mm incision. Through this incision, an 18-gauge needle is passed through the subcutaneous and stomach wall and advanced to the viewing angle of the endoscope. The assistant sends the guide wire to the stomach through the needle, and it is caught with the snare sent from the endoscope and taken out of the mouth with the endoscope. The pointed end of the lubricated PEG catheter is attached to the guide wire taken out of the mouth. The assistant pulls the skin-side end of the guide wire and allows the PEG catheter to reach the stomach through the mouth and esophagus. Pulling the guide wire a little more allows the pointed end with all but the 3-4 cm part of the catheter to be eluxated out of the skin incision. Then, the stomach is reached again with the endoscope to check the entrance of the catheter into the stomach. The catheter length is adjusted, and it is fixed on the anterior abdominal wall using a plastic stopper. The stopper brings the anterior stomach wall closer to the abdominal wall, and the procedure is terminated.

The mentioned procedure was performed with a Fujinon eve E-400 fiber endoscope using the "Pull-through" technique (Gauderer Ponsky). A 20 French Abbot inverta-PEG kit was used during the procedure. Prophylaxis was applied using the first-generation cephalosporins 30 minutes before the procedure. It was ensured that drugs that may cause bleeding diathesis were discontinued, and enteral nutrition was stopped at least 6-8 hours before the procedure. For patients not developing complications during PEG placement, it was recommended to reach the target nutritional dose in correlation with the clinical nutrition unit following the restriction of catheter use for 8-12 hours.

Statistical Analysis

The patients' data were presented as frequencies and percentages (%).

RESULTS

The data of 39 patients, 17 (44%) females and 22 (56%) males, were retrospectively investigated in this study. The median age of the patients was found to be 67 years (21-102 years). While 32 patients were hospitalized in the intensive care unit, four received palliative care, and three were followed up in the clinic wards. Considering the pathologies leading to the indication of PEG catheter placement, 15 patients had Cerebrovascular disease, 12 had Alzheimer's disease, 4 had absent swallow reflex, 3 had a subarachnoid hemorrhage, 2 had a hypoxic brain, 1 had spastic cerebral palsy, 1 had Sanfilippo syndrome, and 1 had oral feeding intolerance. No complications developed in any of the patients during the procedure. While 24 patients were discharged, mortality developed in 15 during hospitalization due to primary pathology. The findings are summarized in **Table 1**.

Table 1. Patients' clinicopathological and demographic characteristics

Number of patients - n	**39**
Sex - n (%)	
Female	17 (%44)
Male	22 (%56)
Age (median)	67 years (21-102 years)
Indication - n (%)	
Cerebrovascular event	15 (38)
Alzheimer's disease	12 (31)
Swallow reflex disorder	4 (10)
Subarachnoid hemorrhage	3 (8)
Hypoxic brain	2 (5)
Spastic cerebral palsy	1 (3)
Sanfilippo syndrome	1 (3)
Oral feeding intolerance	1 (3)
Complication - n	0

DISCUSSION

Despite having regular digestive system functions, patients who need long-term enteral nutrition due to loss of swallowing function or dysphagia are mostly hospitalized in neurology clinics and intensive care units due to a number of diseases developing secondary to an acute or chronic pathology. Therefore, long-term enteral nutrition needs to be planned for such patients both during hospitalization and following discharge. Although it has been more than 40 years since its introduction, PEG continues to be a widely adopted approach in enteral nutrition and hydration.[3,7] Its simplicity was a critical factor in its eventual success and adaptation.[8] PEG is a feeding technique applied when it is thought that oral feeding disrupted for any reason will last at least four weeks.[9] It was previously shown that enteral nutrition with a PEG tube significantly improves patients' quality of life.[10,11]

Mechanical obstruction of the digestive tract (unless the procedure itself is indicated for decompression), the presence of active peritonitis, unrecoverable coagulopathy, and ongoing bowel ischemia are absolute contraindications to tube placement for nasoenteral and percutaneous enteral nutrition.[12] In addition to hemodynamic and respiratory instability specific to percutaneous enteral nutrition, recent gastrointestinal bleeding due to peptic ulcer disease is shown as a contraindication.[5]

Gastrostomy tube placement can be performed with three different techniques: endoscopic (PEG), radiological, and surgical. A recent systematic review study including 1,194 PEG cases reported the technical success rate of PEG to be 90%.[13]

The literature defines the two most commonly used techniques for PEG catheter placement as the 'push' and 'pull' techniques. Today, the best-known and most widely adopted one is the 'pull' technique.[14,15] It was discovered that the pull technique was adopted to place the tubes in the patients in this study.

Compared to nasoenteric tubes, PEG tubes result in less complications (irritation, ulceration, bleeding, esophageal reflux and aspiration pneumonia), higher subjective comfort and even higher feeding efficacy.[16-18] Serious complications (e.g., bleeding, perforation, and peritonitis) during or immediately after gastrostomy are rarely seen (1.8%).[1] Despite the restricted sample size, such serious complications did not develop in the cases in this study.

Patients with pathologies associated with swallowing disorders (e.g., motor neuron diseases and multiple sclerosis), patients with oral intake disorders due to esophageal tumors, head trauma, or stroke, and those with anorexia due to underlying conditions can be counted among the candidates to be fed through feeding tubes.[19] Dysphagic patients and patients with anorexia, malabsorption, or excessive catabolism may also need long-term enteral nutrition.[19,20] In a PEG series of 367 patients by Haggi et al.[3] the most common indication for tube placement was neurological dysphagia in 259 (70.6%) patients and cerebrovascular accident in 212 (81.9%) of them. In addition, other indications were reported to be oropharyngeal tumors (64; 17.4%), laryngeal tumors (31; 8.4%), esophageal tumors (9; 2.5%), and esophageal fistula (4; 1.1%). Overlapping the findings in the literature, the most common indications in this study were found to be cerebrovascular disease, Alzheimer's disease, swallow reflex disorder, subarachnoid hemorrhage, hypoxic brain, spastic cerebral palsy, Sanfilippo syndrome, and oral feeding intolerance.

CONCLUSION

Overall, PEG catheter placement for patients with an indication of long-term enteral nutrition and hydration can be considered the first option that can be safely performed at the bedside without complications in general surgery endoscopy units.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Ankara City Hospital No:1 Clinical Researches Ethics Committee (Date: 22.03.2023, Decision No: E1-23-3389).

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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